

Name: _____

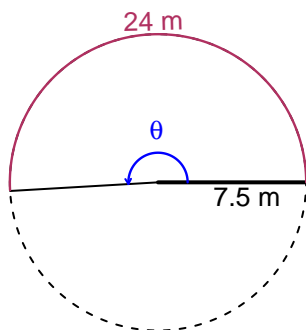
Date: _____

Trig Final (TEST v610)

- You can use a calculator (like [Desmos](#))
- You should have a unit-circle with special angles and coordinates marked.

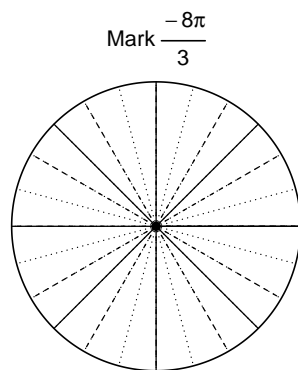
Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The radius is 7.5 meters. The arc length is 24 meters. What is the angle measure in radians?

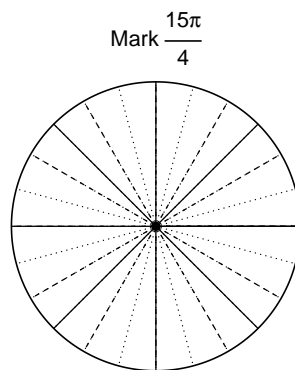


Question 2

Consider angles $-\frac{8\pi}{3}$ and $\frac{15\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\cos\left(-\frac{8\pi}{3}\right)$ and $\sin\left(\frac{15\pi}{4}\right)$ by using a unit circle (provided separately).



Find $\cos(-8\pi/3)$



Find $\sin(15\pi/4)$

Question 3

If $\sin(\theta) = \frac{-40}{41}$, and θ is in quadrant IV, determine an exact value for $\tan(\theta)$.

Question 4

A mass-spring system oscillates vertically with a frequency of 2.48 Hz, an amplitude of 4.18 meters, and a midline at $y = 8.07$ meters. At $t = 0$, the mass is at the midline and moving down. Write an equation to model the height (y in meters) as a function of time (t in seconds).